

10/597 372

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



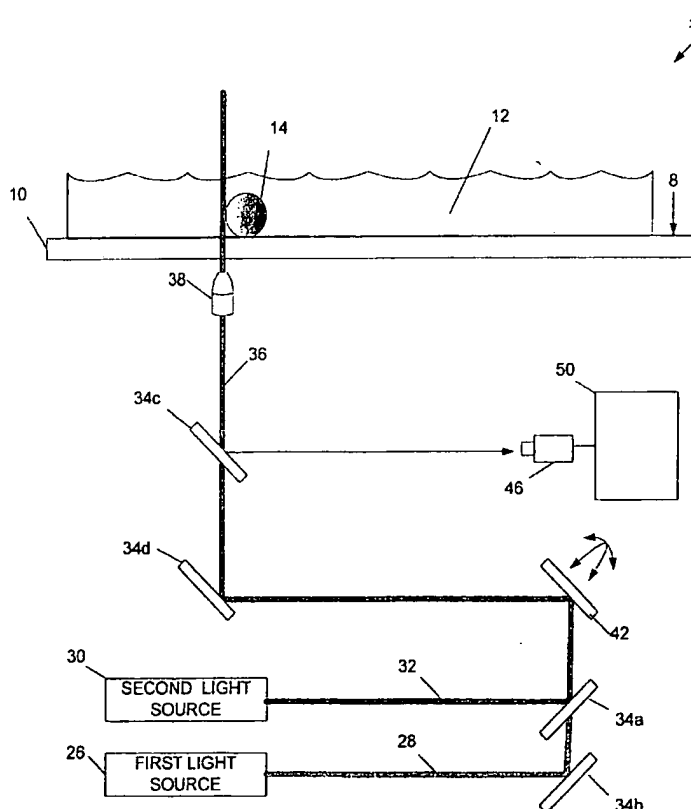
(43) International Publication Date  
4 August 2005 (04.08.2005)

PCT

(10) International Publication Number  
**WO 2005/069964 A3**

- (51) International Patent Classification<sup>7</sup>: **B01L 3/00**,  
3/02, G01N 21/29, 25/22, 21/00, 1/10
- (21) International Application Number:  
PCT/US2005/002033
- (22) International Filing Date: 21 January 2005 (21.01.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/538,951 23 January 2004 (23.01.2004) US
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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,
- [Continued on next page]

(54) Title: APPARATUS AND METHOD OF MOVING MICRO-DROPLETS USING LASER-INDUCED THERMAL GRADIENTS



(57) Abstract: Described are an apparatus (4) and method of moving micro-droplets. A surface (8) has a liquid phase (12) thereon. In the liquid phase is a droplet (14). Focused at an edge of the droplet is a beam of light (28). The light beam produces a thermal gradient sufficient to induce the droplet (14) to move according to the Marangoni effect. The movement-inducing thermal gradient may appear within the droplet or within the liquid phase. The composition of the droplet, the liquid phase, and wavelength of the light beam can cooperate to cause heating within the droplet, liquid phase, or both. For example, an infrared laser can cause vibration of an O-H stretch in an aqueous droplet (or in the liquid phase). As another example, adding dye to a droplet or to the liquid phase enables absorption of light from an Argon ion laser. The apparatus and method find particular use in biological and chemical high-throughput assays.

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GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:  
22 September 2005

**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*